MREs

These MREs of today...

Can Cause More Than Heartburn

In March 2001, this reefer full of flameless ration heaters burst into flames.

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Anyone in the Marine Corps or Army knows about meals ready to eat (MREs) and flameless ration heaters (FRHs). They're what Marines and Soldiers started using in the field (replacing C-rations and K-rations of World War II fame) during Operation Desert Storm.

The main course of an MRE is something like chicken stew or spaghetti and meatballs in a pouch that's made of plastic and aluminum foil. You heat the food by dropping the pouch into a pot of boiling water or leaning it against the exhaust manifold of an engine. When there's not enough time to boil water or wait for dinner to heat on an engine, you use the FRH that comes with each MRE.

You simply drop the food pouch into the FRH, which is enclosed in a thin, plastic sleeve. You then add a small amount of water to the sleeve and shove it into the food-pouch box. The FRH contains magnesium metal that combines with water to form magnesium hydroxide, which causes a little chemical magic called an "exothermic oxidation-reduction reaction." This reaction transfers enough energy to heat the meal without flame or smoke (e.g., the same principle used in the hand warmers you find in camping stores).

Besides the magnesium, the FRH contains some iron powder and salt. The iron's function isn't clear, but the chloride ions of the salt promote the water-magnesium action. If the magnesium in an FRH has been exposed to moist air at any time, its surface will be coated with a thin layer of insoluble magnesium hydroxide.

Some MRE manufacturers boast, "Enjoy a hot meal in 12 minutes–anytime, anywhere!" What they don't tell you is how many antacid

...are more high-tech than these K-rations of World War II, but both could cause heartburn.

U.S. Army photo

tablets you may need afterward–a tiny problem, though, compared to one encountered at Naval Station, Guam, in March 2001.

A 20-foot reefer holding FRHs had been loaded aboard a container ship pierside. The ship's crew had identified the reefer as a hazard because the hydrogen-gas temperature was higher than the lower explosive limit (LEL). Workers moved the reefer from the ship to a secluded area of the freight-terminal area of the Naval Station.

Firefighters from the base fire department oversaw this operation and decided the best way to cool the contents was to spread everything among three containers. While moving the contents, a forklift operator noticed that some pallets on the tines were smoldering. He abandoned the forklift before it burst into flames and hurried from the area with no injuries. Meanwhile, the firefighters put sand around the reefer and let the fire burn out. The reefer, its cargo, and the forklift were total losses.

Workers checked the LELs of the container ship's remaining 20 reefers. Three of them also had elevated limits and were removed. The others were monitored every two hours.

Afterward, officials met and discussed the disposition of refrigerated containers. They also looked at the idea of double wrapping FRHs to prevent any recurrences of this type mishap. *A*

This forklift and the reefer were total losses.